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Multilingualism in metacognitive and self-regulation research: scoping review advocating for comprehensive representation of multilingual complexity[1]

Multilingüismo en investigaciones metacognitivas y de autorregulación: revisión de alcance que aboga por una representación integral de la complejidad multilingüe

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Abstract

Metacognition and self-regulation play crucial roles in second language acquisition, but their roles in multilingual (L3+) contexts remain underexplored. This scoping review sought to examine how metacognition and self-regulation manifest in learning third or additional languages, particularly regarding how multilingualism was accounted for in the empirical research surrounding these constructs. Three inclusion criteria were: L3+ participants, variables related to metacognition and/or self-regulation, and empirical/experimental design. Studies on test or technology validations, or nonlanguage domains were omitted. A comprehensive search across three databases yielded 52 studies, which were analyzed to assess their exploration of multilingualism's impact on metacognitive and self-regulatory processes. Findings revealed that while these cognitive strategies are crucial for navigating complex linguistic environments, studies often conflated bilinguals with multilinguals, limiting insights into how varied linguistic repertoires influence metacognition and self-regulation. Future research must better differentiate between these groups and investigate how managing multiple languages fosters unique self-regulatory action in multilingual learners.

Keywords: Metacognition, self-regulation, language learning strategies, multilingualism, scoping review.

Resumen

La metacognición y la autorregulación juegan un rol crucial en la adquisición de segundaa lenguas, pero sus funciones en contextos multilingües (L3+) permanecen poco exploradas. Esta reseña de alcance buscó examinar cómo se manifiestan la metacognición y la autorregulación en el aprendizaje de tercera lengua y lenguas adicionales, particularmente en relación con cómo se ha considerado el multilingüismo en la investigación empírica sobre estos constructos. Los tres criterios de inclusión fueron: participantes L3+, variables relacionadas con la metacognición y/o la autorregulación, y diseño empírico/experimental. Se omitieron estudios sobre validaciones de pruebas o tecnologías o dominios no lingüísticos. Una búsqueda exhaustiva en tres bases de datos arrojó 52 estudios, los cuales fueron analizados para evaluar cómo se explora el impacto del multilingüismo en los procesos metacognitivos y de autorregulación. Los hallazgos

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revelaron que, aunque estas estrategias cognitivas son cruciales para navegar entornos lingüísticos complejos, los estudios a menudo confundieron a los bilingües con los multilingües, lo que limitó los conocimientos sobre cómo los repertorios lingüísticos variados influyen en la metacognición y la autorregulación. Las investigaciones futuras deben diferenciar mejor entre estos grupos e investigar cómo la gestión de múltiples lenguas fomenta una acción regulatoria única en los aprendices multilingües.

Palabras clave: metacognición, autorregulación, estrategias de aprendizaje lingüístico, multilingüismo, reseña de alcance.

Introduction: Strategic, self-regulatory, and metacognitive processes in multilingual language learning

The importance of metacognition (MC) and self-regulation (SR) is well-established in Second Language Acquisition (SLA) studies (Teng, 2023a, 2023b), as research has consistently shown the positive impact of reflectivity, monitoring, regulation, and strategic learning on developing second and additional languages (Anderson, 2009; Öz, 2005; Teng & Zhang, 2018; Teng & Zhang, 2021). Metacognition (MC) is frequently recognized as a valuable attribute that enhances learning, often described as a "seventh sense" (Doğan & Tuncer, 2017) and "an essential tool for lifelong learning" (Teng, 2023b). Self-regulation (SR), similarly, is valued for its application across specific language skills like phonology (Moyer, 2014), vocabulary learning (Gorgoz & Tican, 2020), writing (Sun & Wang, 2020), and reading (Kamgar & Jadidi, 2016).

However, despite the wealth of research on MC and SR within SLA, these studies have not always incorporated recent theoretical advancements that distinguish multilingualism from second language learning. This oversight is significant because multilingual learners possess a more complex linguistic repertoire, and it could be hypothesized that they have a heightened awareness of their learning processes in comparison to second language learners (De Angelis, 2007; Greve et al., 2024; Jessner, 2008b). The experience of managing and navigating multiple languages could mean that multilingual individuals have developed sophisticated strategies for monitoring, regulating, and assessing their language learning, potentially leading to more refined self-regulatory behaviors (Jessner, 2018). Such features suggest that the transfer of self-regulatory skills between languages, or the metacognitive awareness gained from managing several linguistic systems, may offer unique insights that SLA frameworks have yet to address fully.

This scoping review seeks to investigate the extent to which current literature on SR and MC in language learning accounts for the specificities of multilingual populations. While there has been growth in research on metacognition and, to some extent, self-regulation, there remains a lack of comprehensive theoretical frameworks and cohesive methodologies to integrate these areas into the multilingual context.

The fragmented nature of the research landscape presents challenges to drawing consistent conclusions, as studies differ significantly in their approaches to investigating MC and SR in multilingual settings. A scoping review allows mapping the range and scope of existing literature to provide a clearer understanding of how these concepts are being studied and highlight the literature gaps that future research should address (Arksey & O'Malley, 2005). Ultimately, addressing these gaps will allow for a more thorough representation of the cognitive and strategic advantages multilingual learners possess, offering insights into how language experience can enhance metacognitive and self-regulatory processes in multilingualism.

The present paper is part of a broader review that aimed to explore several critical aspects of MC and SR in multilingual populations. This extensive review examined three primary

dimensions: the theories of MC and SR commonly applied to interpret learning outcomes in multilingual contexts, the methodologies employed to measure these constructs, and the intersections between selected studies and established theories of multilingualism. While the overarching review considered all these aspects, this article focuses specifically on the third dimension: how multilingual individuals and their unique characteristics are conceptualized within the SR and MC literature. By narrowing the scope to this critical aspect, this article aims to address gaps in the current understanding of how the distinct features of multilingualism are integrated—or overlooked—in the existing body of SR and MC research.

In particular, this study discusses three aspects of the intersections of multilingualism and MC/SR research: 1) How important is it for the designs of the reviewed studies that the participants use more than two languages? Are the characteristics of multilinguals discussed as parts of their designs? 2) Concerning the intellectual structure of the cited literature within the reviewed papers, how do the individual works of supporting literature interact, and what kinds of intellectual structures emerge from these interactions? 3) Concerning the conceptualization of multilingual populations, how are these participants referred to, and under what criteria (practical or theoretical) are these concepts established?

Theoretical background

Clarifying the concepts of metacognition and self-regulation

Conceptually, MC and SR significantly overlap, complicating their distinction, as both involve intentional control over cognitive processes and behavior (Dinsmore et al., 2008). MC models include self-regulatory mechanisms as key elements (Brown, 1987), while SR frameworks highlight many inherent components as "metacognitive" to emphasize their cognitive nature. This overlap leads to somewhat circular definitions and distinctions (Teng, 2023a).

Whereas MC addresses the cognitive processes involved in self-reflection and the regulation of cognition, SR encompasses social, behavioral, and emotional processes (Dinsmore et al., 2008). In any case, both frameworks are concerned with the adaptation of one's learning process through reflection, self-awareness, and intentional adjustment of behavior to accomplish learning goals. Beyond these differences in focus, research on these topics has revealed inconsistencies in the underlying theoretical assumptions of both perspectives, including different constructs and categories to make sense of general regulatory phenomena.

MC was first introduced by Flavell (1976) as "cognition of cognition," encompassing two basic mechanisms: cognitive monitoring and control (Efklides, 2008). Flavell's (1979) subsequent influential model of metacognition identifies four components: metacognitive knowledge (divided into person, task, and strategy knowledge), metacognitive experiences, cognitive goals, and cognitive actions (or strategies). The interaction of these components is fundamental to achieving cognitive monitoring, i.e., "the reflective awareness and monitoring of mental states and processes, including the ability to control, judge, evaluate and regulate the status of knowledge within one's cognitive system" (Tarricone, 2011, p. 128). Brown's (1987) model deepens the understanding of metacognition as adaptive regulatory mechanisms by dividing metacognition into two clusters: "knowledge of cognition" (self-awareness) and "regulation of cognition" (monitoring and cognitive control.

On the other hand, SR refers to an individual's cognitive, motivational, and emotional engagement through active participation in achieving a learning goal, requiring learners to control personal and environmental factors involved in the process (Teng, 2023a). Tsuda and Nakata (2013) emphasize the multifaceted nature of SR and its value, affirming that it "embraces cognitive, behavioral, and affective aspects of learning, thus offering great potential for comprehensively exploring the learning process" (p. 73).

M. F. Teng (2023a) provides an overview of the most used models of self-regulation, i.e., Zimmerman's socio-cognitive model, Boekaert's Dual Processing Self-Regulation model, Winne and Hardwin's Metacognitive model and Pintrich's motivation-focused model. These models emphasize two dimensions of self-regulation: the components and factors that intervene in individuals' self-regulation (e.g., environment, tasks, knowledge, motivation, strategies, beliefs, etc.) and the stages through which self-regulation is carried out (e.g., forethought, goal setting, self-reflection, monitoring, performance, control, assessment, appraisal, adaptation). Furthermore, they assert that self-regulated learners engage in self-initiated actions to control factors such as their beliefs about their cognition and the tasks they face, their behaviors and actions, and their surrounding learning environments, and thus can regulate their internal and external learning resources to ensure good learning outcomes (Teng, 2023a).

Dörnyei (2005) is often credited with introducing SR in SLA research. He highlighted the advantages of the SR framework including a focus on the process rather than the product of successful learning, and also its broad perspective towards other cognitive and behavioral processes involved in the learning process. In recent years, researchers have studied SR as a predictor of learning and academic success (Seker, 2016; Tılfarlıoğlu & Delbesoğlugil, 2014) and its relationships with other individual differences. These include elements such as gender (Tseng et al., 2017), affect (Huang, 2022), language learning strategies (Canbay, 2020; Erdogan, 2018), and self-efficacy (Su et al., 2018). While there is general optimism about the application of SR in language learning settings, M. F. Teng (2023a) affirms that there is still insufficient evidence to assume a universally applicable positive link between self-regulated, strategic behaviors and language learning achievement.

Multilingualism as a complex phenomenon

Current research has underscored the need to distinguish second language acquisition from the learning of additional languages (L3/Ln) to reflect the complexity of multilingual development more accurately (Aronin & Hufeisen, 2009; Auer & Wei, 2007; Cenoz, 2003, 2013; De Angelis, 2007; Hammarberg, 2010; Herdina & Jessner, 2002). In this regard, Complex and Dynamic Systems Theory (CDST) has gained importance as a meta-theory of language acquisition and learning, as "an approach to creating theory" (MacIntyre et al., 2021, p. 15) to support empirical research in multilingualism research. This theoretical perspective emphasizes the interconnectedness of various factors influencing language acquisition, recognizing that language learning is a non-linear, dynamic process (Herdina & Jessner, 2000; Jessner, 2018). Furthermore, CDST intends to account for learner variation, particularly under the understanding of sensitive dependence on initial conditions. This theoretical tenet states that "minimal differences between learners may, even when they go through similar learning experiences, lead to very different learning outcomes" (De Bot & Larsen-Freeman, 2011, p. 10).

As these recent views on multilingual complexity have maintained (e.g., Ortega & Han, 2017), learning a third or subsequent language fundamentally differs from learning a second language (Aronin & Jessner, 2014; De Angelis, 2007). This distinction arises from the multilinguals' access to more than one linguistic system and their ability to draw on prior linguistic knowledge, making L3 learning more streamlined than L2 (Mulík, 2018). Moreover, by taking the principles of CDST, Herdina and Jessner (2002) have conceptualized this difference in terms of the "M-Factor," which describes unique features of multilingualism—such as multilingual awareness, monitoring, and learning strategies—that are not present in monolingual or even L2 learners (Cenoz & Jessner, 2009). These distinct cognitive features of multilingualism require a more nuanced understanding of how SR and MC function in multilingual populations. Multilinguals may possess metacognitive and self-regulatory advantages stemming from their accumulated language learning experience.

Considering this hypothetical advantage in multilingual learners and taking into account how multilingualism might result in increased complexity, labeling third or additional language learning as bilingual or second language acquisition becomes highly controversial. Many researchers use "L2 to cover any instance of non-primary adult language acquisition" (Rothman et al., 2013, p. 1), encompassing the acquisition of third and subsequent languages. Thus, many L3/Ln phenomena have been understood within the generalized scope of SLA research (De Angelis, 2007; Safont Jordà, 2005).

Integrating L3/Ln acquisition or multilingual development into SLA presents several problems. Firstly, there is consensus on bilinguals' advantage in learning additional languages (Cenoz & Hoffmann, 2003), and disregarding this advantage may overlook critical factors like linguistic and metalinguistic knowledge (Rothman et al., 2013), as well as cognitive and metacognitive experiences. Secondly, the initial state of learners may differ significantly between L2 and L3/Ln learners, leading to substantial contrasts in transfer and interlanguage development (Cenoz et al., 2001; García-Mayo & Rothman, 2012). Thirdly, this perspective may neglect many sociolinguistic factors, such as language histories, order of learning, learning situations, contexts of use, sociocultural environments, language status, and power dynamics within speech communities (Safont Jordà, 2005), issues that have been taken in recent decades by sociocognitive perspectives (e.g., Atkinson, 2002).

A synthetic perspective on the difference between learning a second language (L2) and additional languages posits that “third language acquisition or TLA is more complex than second language acquisition (SLA) because, in addition to individual and social factors affecting SLA, the process and product of acquiring an L2 can influence the acquisition of a third language” (Cenoz & Jessner, 2000, p. 9). Therefore, multilingualism and SLA should be viewed as distinct yet interrelated phenomena.

Even if the distinction between L3/Ln acquisition and SLA has achieved a certain level of consensus (the active development of the latter as a research line and as an independent field supports this; Rothman et al., 2013), any attempt at a definition is not clear-cut. Some researchers adopt a chronological approach, viewing L3 as the language learned after a second one, while others argue that it includes any language learned post-bilingual proficiency (Hammarberg, 2014; Rothman et al., 2013). This study adopts a pragmatic stance, defining L3/Ln as any language acquired in adulthood after proficiency in L2. This excludes bilingual children learning a third language, as their simultaneous acquisition of two languages in childhood could be seen as learning two L1s. Thus, acquiring a third language in adulthood would be considered SLA in these cases.

The challenge is to question what De Angelis (2007) has called "bilingual bias" in multilingual studies, that is, "the tendency to view multilinguals as bilinguals with some additional languages rather than as speakers of several languages from the start" (p.15). This assumption may reflect a limited understanding of multilingualism, a phenomenon with unique patterns that should not be constrained to a bilingual model.

This scoping review addresses a significant gap in the literature by examining the explicit application of MC and SR in selected multilingualism research. The following methodology section will detail the systematic approach to exploring and synthesizing existing knowledge, focusing on the representation of multilinguals.

Methods

Protocol

To ensure the study's methodological rigor and reproducibility, a review protocol was created using the PRISMA Extension for Scoping Reviews (PRISMA-ScR) (Tricco et al., 2018) and registered in the Open Science Framework on August 8, 2023 (https://osf.io/96ehf/). The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) protocol explains the basic components of scoping reviews, including the reasoning behind the research question, aims, eligibility criteria, information sources, search and selection strategy, and general findings.

Eligibility criteria

This review is based on articles and dissertations from the last decade (2013-2023) sourced from Scopus, Web of Science, and PsycInfo. This time frame was selected to focus on recent research. Scopus and Web of Science were chosen for their extensive, interdisciplinary coverage, while PsycInfo was included for its focus on psychological and behavioral science research. The search was conducted in English, but studies in Spanish, German, French, and Turkish were also included using automatic translations and language proficiency.

Search strategy

The query strings considered the two selected constructs (i.e., MC and SR) in combination with concepts related to multilingualism (e.g., multilingual, plurilingual, third language, etc.) These searches were carried out separately to see which strings produced more results that would shed light on the most prevalent concepts in the literature. In this sense, the strings related to metacognition/self-regulation and language learning yielded the most results, as seen in Table 1.

Table 1. Hits per search string in bibliographic databases

	Search string	PsycINFO	Web of Science	Scopus
S1	Metacognit* + multilingual*	44	61	79
S2	Metacognit* + language learning NOT second language acquisition	163	257	349
S3	Metacognit* + "third language"	1	7	8
S4	Metacognit* + "language development" NOT child*[3]	14	5	18
S5	Metacognit* + plurilingual*	1	5	8
S6	Self-regulat* + multilingual*	40	34	31
S7	Self-regulat* + language learning NOT second language acquisition	235	253	331
S8	Self-regulat* + "third language"	1	1	2
S9	Self-regulat* + "language development" NOT child*	17	5	15
S10	Self-regulat* + plurilingual*	1	0	2
	Total	Total: 1988		

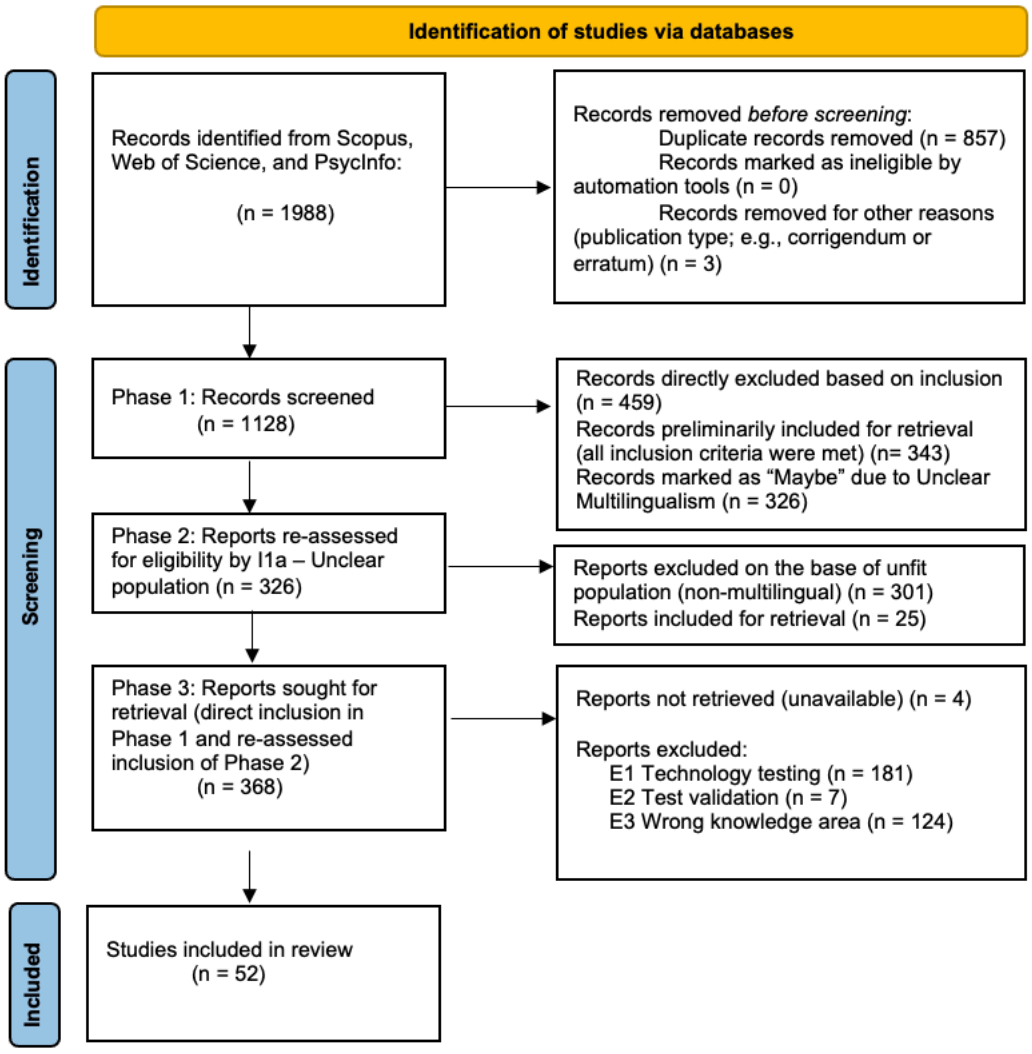
Source: Own elaboration

Study selection process

The screening involved reviewing titles, abstracts, and keywords, and applying inclusion (e.g., multilingual population) and exclusion criteria (e.g., test validation study) to select studies for review. In some cases, a detailed review of texts focused on study participants was necessary. Some authors explicitly mentioned pluri/multilinguals and described the participants' linguistic repertoires, while others only noted other languages spoken by participants without specifics. This ambiguity required verification of the selected samples to ensure they included multilingual populations. The following figure summarizes the study selection procedure.

[3] The search string "self-regulati*/metacognit* AND language development AND NOT child*)" was chosen because of the theoretical precision resulting from the application of CDST to this area of research (van Geert & Verspoor, 2015; Verspoor et al., 2011). This theory understands the learning and acquisition of additional languages from the perspective of "language development," in the sense that the acquisition of additional languages is not a linear process, and no native-like ultimate attainment is expected (De Bot & Larsen-Freeman, 2011). In this sense, the term "acquisition" lacks this precision, hence the use of the category "language development." To minimize the hits related to children's native language acquisition, I used the restrictive Boolean operator "AND NOT child*."

Figure 1. Flow chart for the selection of literature for review according to PRISMA guidelines



Source: Own elaboration

Data extraction

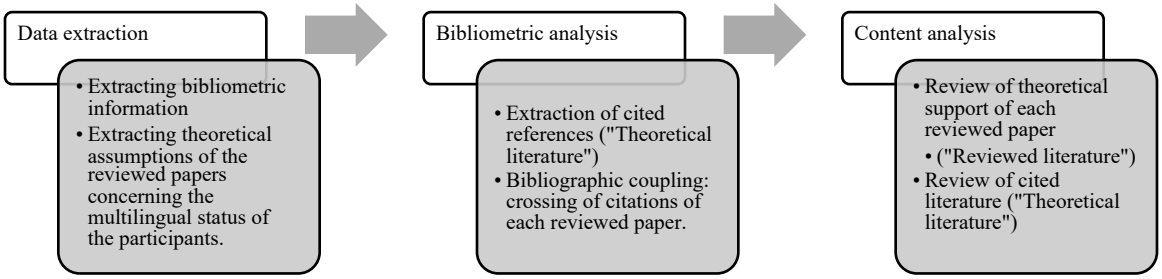
After screening and selection, the papers' metadata, including references, were exported for bibliographic coupling. A spreadsheet was created to systematize information on background assumptions, theories, research areas, problems and questions, variables, operational concepts, methodological frameworks, participant descriptions, conclusions, and limitations. Each column, representing a specific research aspect, was reviewed and categorized through thematic analysis, establishing general categories for comparative or contrasting perspectives on research questions.

Data analysis

The analysis consisted of two main processes. The first process was a quantitative network analysis based on bibliographic coupling. Bibliographic coupling shows the relationships between articles based on their references: articles are considered "coupled" if they cite at least one source in common (Kessler, 1963). The cited literature was systematically extracted and compared to reveal which texts were more influential, assuming that if certain articles are more frequently cited, they are part of the social and intellectual network that gives theoretical support to the area of research.

The second process involved a thematic analysis of the theoretical assumptions in the reviewed articles and their cited literature, which theoretically supported the articles. The articles were assessed for how they defined their populations and whether they included theoretical reflections on multilingualism or related theories. The cited literature was summarized and categorized through thematic analysis to identify its theoretical positions on bilingualism, multilingualism, or L2/L3/Ln acquisition. To address the varied use of terminology, the analysis explicitly acknowledged each article's conceptualizations and arguments regarding the characteristics of their populations while verifying the theoretical support for these concepts. This aimed to map the variety of theories describing these populations and explore the assumptions imposed by different theoretical frameworks. The objective was to understand how these theories influenced the interpretation of the studied populations, revealing the assumptions inherent in each theoretical perspective. The following figure summarizes the analytical process.

Figure 2. Summary of data extraction and analysis steps



Source: Own elaboration

Having outlined the methods used for data analysis, we now turn to the results obtained from these processes to explore the key findings and their implications.

Results

Development of theories of multilingualism (or alternative models) in metacognition and self-regulation literature.

The present section deals with the relationship of the reviewed literature with theories of multilingualism, specifically, whether they dealt with the multilingual status of the participants in a meaningful and systematic manner (i.e., how having multiple languages in their repertoires might influence linguistic, cognitive, or social processes under study). To establish the importance of

multilinguals and theories of multilingualism in MC/SR literature, the selected texts were analyzed using three sub-questions: 1) Is the multilingual status of the participants clearly stated in the given article? 2) Was the multilingual status of the participants essential to the research design? 3) Did the text present theoretical support or discussion in theories of multilingualism? A summary of the data can be accessed in Appendix 1 Database for Multilingualism theories and multilingual participants in MC/SR literature, found in the following link: https://osf.io/n8mzk

Table 2 summarizes the results of these queries.

Table 2. Summary of queries concerning multilingual theories in the reviewed literature

		Theoretically discussed/developed		
Multilingualism clearly discussed	**Total**	**Developed/ Discussed**	**Not developed**	**Partly**
Clear	**44**	**10**	**30**	**4**
Important for design	21	10	9	2
No	23		21	2
Unclear	**8**		**8**	
Total	**52**	**10**	**38**	**4**

Source: Own elaboration

As can be ascertained in Table 2, most studies (n = 44) explicitly established and discussed the participants' multilingual backgrounds. Descriptions testified of different levels of detail, sometimes by establishing the parameters and criteria of participant recruitment (e.g., L3-English speakers, foreign language learners in multilingual societies), and sometimes by describing the linguistic repertoires of the participants in detail. The rest of the studies (n = 8) only marginally mentioned the presence of other languages as part of participants' linguistic repertoires or broadly referred to the studied phenomena as "multilingualism". However, there is ambiguity about whether this category applies only to the research context or to a portion of the full sample.

While many studies explicitly stated an interest in multilingualism, this did not imply that the participants' multilingual status consistently affected study designs or the development of L3 acquisition or multilingualism theories. Among the 44 studies highlighting multilingualism, only 21 incorporated multilingualism or L3 acquisition/learning into their research design and theoretical discussions, as evidenced by their bibliographic references. Of these 21 studies, only 10 engaged deeply with L3/multilingual development, using specialized theoretical literature and contributing to the intellectual framework of this research area, while 2 did so only partly.

In general, three levels of theoretical stances were found: 1) Explicit and developed theoretical development of multilingualism/L3 acquisition as a particular phenomenon; 2) explicit acknowledgment of multilingual/L3 populations, with no (or minimal) clear development or interest in this theoretical issue, and 3) no acknowledgment of specificities of multilingual populations. The latter could be interpreted as a full amalgamation of L3+ phenomena to bilingualism or SLA.

An example of an explicit development of theoretical support for multilingualism is Haukås (2015). In her study "A Comparison of L2 and L3 Learners' Strategy Use in School Settings," she establishes the role of prior language experience in additional language learning, stressing the potential increased metalinguistic ability of L3 learners with the support of Cenoz (2003), De Angelis (2007) and Jessner (2008a), all of which are pivotal texts in L3 acquisition research. With

the underlying support of these authors, she defines her understanding of L3 Acquisition as a particular phenomenon distinct from SLA and explains the particularities of L3 learners' strategy use. Furthermore, she makes the conceptual precision of working with "plurilinguals," that is, L3 learners that have "proficiency of varying degrees in their languages" (p. 385). In this case, the criteria sought for the questions above are all achieved: 1) the multilingual status of the participants is clearly and unequivocally established, 2) the multilingual character of the participants was essential for the design, and 3) the text presented theoretical support from explicit L3 acquisition theories.

An example of the second stance, where there is an acknowledgment of multilingual character but no clear theoretical development, would be Silawi, Shalhoub-Awwad, and Prior (2020). In their research "Monitoring of Reading Comprehension Across the First, Second, and Third Language," they clearly establish the multilingual linguistic repertoires of their 80 participants, all trilingual in Arabic, Hebrew, and English. In this case, it is also fundamental for the study design that these participants have these characteristics, for they want to trace the monitoring abilities of these readers across languages. However, their theoretical focus is set in L1 and L2 reading comprehension, along with reflecting on the domain-general or language-specific nature of comprehension monitoring. They highlight their research gap by affirming that "hardly anything is known about the contribution of metacognition to L3 reading comprehension" (p. 890), a statement with which I concur, as my own research also points to this gap. However, despite acknowledging the gap, their text does not explore the potential impact of multilingualism on monitoring processes. Instead, their focus remains solely on monitoring itself, without considering how the complexities of multilingualism might influence or shape these processes.

An example of the last stance is Šafranj and Gojkov-Rajić (2020), who examined the role of personality traits in Language Learning Strategy use. In their method section, these authors explicitly indicate that the participants are L1-Serbian speakers with German and English either as L2 or as L3. However, the theoretical support for this research is focused on LLS research and the Big Five Personality Traits by Goldberg (1992). The role that the participants' target language might have in influencing the selection of strategies, along with prior language learning experience, is not recognized. Other examples such as Le Pichon et al. (2013), Csizér and Tankó (2017), Piechurska-Kuciel (2016), Forbes (2019), and others present the same issue: they acknowledge the presence of multiple languages but do not regard it as essential either for research design or for theoretical justification. We might consider these cases full amalgamations of L3 phenomena into L2-based theoretical frameworks.

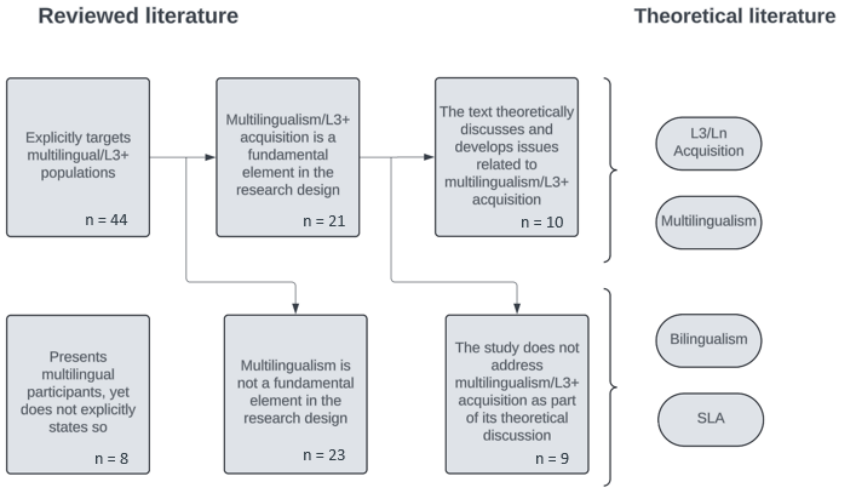
After examining the role of multilingual theories in the reviewed studies and their use in conceptualizing multilingual participants, the next section delves into the intellectual foundations of this theoretical literature. It explores the intersections between multilingualism theories and the literature on MC and SR, highlighting how these frameworks influence each other in shaping the research landscape.

Supporting bi/multilingual theories: Intellectual structure and intersections with MC/SR literature

Through the analysis, an overview of the intellectual structure was created by categorizing the cited literature into distinct conceptual frameworks of language learning theories. These frameworks were grouped into four main categories: L3/Ln acquisition, multilingualism, bilingualism, and SLA. These frameworks were identified due to their clear differentiation in focus. L3/Ln

acquisition (e.g., Cenoz, 2003; Cenoz et al., 2001; De Angelis, 2007; De Bot & Jaensch, 2015) emphasizes the unique processes of acquiring a third or subsequent language. Multilingualism (e.g., Cenoz, 2013; Cenoz & Gorter, 2013, 2015; Herdina & Jessner, 2002; Jessner, 2008) addresses the complexity of managing multiple languages over time. Bilingualism (e.g., Bialystok, 1978; Bialystok & Craik, 2010; Bialystok et al., 2012) centers on the cognitive and linguistic dynamics of using two languages. Lastly, SLA (e.g., Cook, 2007; Dörnyei & Skehan, 2003) focuses on the processes and mechanisms involved in acquiring a second language and achieving bilingual proficiency. Each category reflects a particular approach to understanding language learning, providing valuable insights into how multilingual participants are conceptualized in the reviewed studies. Figure 3 displays these relationships between the multilingual stance of the research and the theoretical literature reviewed and categorized as mentioned above.

Figure 3. Theoretical relationship of the reviewed articles with theories of multilingualism



Source: Own elaboration

L3/Ln research explores the distinct cognitive and linguistic processes in acquiring a third or subsequent language (De Angelis, 2007). This framework highlights that L3 acquisition involves the learner's entire linguistic repertoire rather than merely extending L2 learning (Cenoz & Gorter, 2011). Theories emphasize the cumulative nature of L3 acquisition, where prior language knowledge shapes new language acquisition through cross-linguistic influence (CLI; Ortega Duran, 2017). Previously learned languages interact with the third language, with similarities and differences affecting learning strategies and outcomes (D'Angelo, 2020). Overall, L3/Ln research underscores the importance of the learner's entire linguistic repertoire and highlights the dynamic, interconnected nature of language acquisition.

On the other hand, multilingualism research addresses the complex and evolving nature of managing multiple languages to different levels of proficiency (for a discussion on how multilingualism is defined, see Aronin & Singleton, 2012). A key concept in this field is the Dynamic Model of Multilingualism (DMM) proposed by Herdina and Jessner (2000, 2002), which frames multilingual development as a non-linear and dynamic process. According to this model, multilingualism is shaped by constant interactions between cognitive, social, and linguistic factors, leading to shifts in language dominance and use over time (Ortega Duran, 2017). A key notion

within this framework is that multilinguals[4] develop metalinguistic awareness, enabling them to reflect on and regulate their language use, enhancing their overall linguistic competence (Jessner, 2008a). Additionally, research highlights the cognitive benefits of multilingualism, such as improved cognitive abilities, problem-solving abilities (Greve et al., 2024), metalinguistic awareness (Ortega Duran, 2017), and strategic flexibility (Alvarado, 2016; Jessner, 2018).

Research on bilingualism has consistently highlighted the social and psychological processes involved in managing two languages (Hamers & Blanc, 2009). Bialystok's early work emphasized the role of bilingualism in developing different levels of linguistic awareness, as bilingual individuals must actively manage and switch between languages, enhancing their ability to reflect on language structure and use (Bialystok, 1988). Bialystok and Craik (2010) expanded this understanding by exploring the broader executive control benefits of bilingualism, such as improved multitasking and cognitive flexibility, as bilinguals constantly engage in attentional control to manage their two languages (see also Bialystok et al., 2012). This line of research has shown that bilingualism provides long-term cognitive benefits, with studies suggesting that bilinguals experience delayed onset of cognitive decline, including symptoms of Alzheimer's disease (Craik et al., 2010) and general age-related decline (Calabria et al., 2020). Furthermore, more theoretical strands of research initially argued for the particularities of bilingualism as compared to monolingualism, for instance the work by Grosjean (1985) and Cook (1991, 2007) concerning bilingual competence (i.e., the characteristics of bilinguals as a specific kind of language user which cannot be conceived as having two separate language entities, as in being two monolinguals in one).

SLA research explores the mechanisms involved in acquiring a second language and achieving bilingual proficiency, which may include sociolinguistics, practices, identities and cognitive factors (Thomas et al., 1999). One key concept is the development of multi-competence (Cook, 1991), where learners develop distinct linguistic systems that reflect their bilingualism. Research also emphasizes the importance of motivation and cognitive factors, as individual differences and learning environments impact language learning success (Dörnyei, 2009; Dörnyei & Skehan, 2003; Li et al., 2022). Additionally, SLA is seen as an interactive process shaped by social, cultural, and environmental contexts, where affordances influence second language use in the learner's surroundings (Aronin & Singleton, 2012). These perspectives together highlight the dynamic, multifaceted nature of SLA.

Having observed the variety of paradigms used to understand language learning phenomena, it becomes clear that establishing intersections with MC/SR literature is challenging. However, one way to examine this interaction is to explore the role that bi/multilingualism plays in relation to MC/SR in the reviewed literature. In this sense, two stances were identified. First, the consideration of MC/SR as essential elements in the language learning process (Alshreif, 2021; Calafato, 2020; Csizér & Tankó, 2017; Forbes, 2019; Forbes & Fisher, 2020; Hanžić Deda, 2021; Hassan, 2017; Piechurska-Kuciel, 2016; Šafranj & Gojkov-Rajić, 2019; Silawi et al., 2020; Wang & Cáceres Lorenzo, 2019). Secondly, the possibility that MC or SR could be developed or enhanced due to increased prior knowledge and experience of multilingual populations (Abu Rabia, 2019; Aksak & Cubukcu, 2022; Bourgoin & Dicks, 2019; Festman & Schwieter, 2019; Filippi et

[4] It is important to note that, according to this framework, bilingualism is a form of multilingualism (Herdina & Jessner, 2002, p. 4). Hence, it is understood that bilinguals also develop metalinguistic awareness. The question remains whether multilinguals keep developing more complex and sustained forms of metalinguistic awareness as they grow their linguistic repertoires.

al., 2020; Maghsoudi et al., 2022; Razkane & Diouny, 2022; Redmer, 2022; Soleimani & Rahmanian, 2018; Sommer-Farias, 2020; Tavakol et al., 2019; Wach, 2016). In the first case, multilingualism plays a less prominent role because metacognitive or self-regulatory development is not considered a unique feature of multilinguals but rather a category applicable to language learning in general, whether it involves second or subsequent languages. In the second case, multilingualism, by adding complexity based on learners' prior experience, becomes a central element in its intersection with MC/SR studies. This distinction, in fact, may influence how we understand the relationship between these elements, whether in a causal or dialectical manner.

Conceptualization of speakers of many languages: Few definitions, criteria, and boundaries

As mentioned earlier, the multilingual nature of the participants in the selected literature was not consistently treated as a central concern. In many cases, it neither prompted theoretical reflection nor justified how these participants were described. This observation raises an important question: Given that all the studies included multilingual participants, how were these individuals conceptually framed?

Table 2 summarizes the conceptualizations used to describe the participants in each study, further categorized by criteria to define such concepts. These criteria show the diversity of understandings of multilingualism and the underlying assumptions of different theoretical approaches to define language learners. That is, if a study defined their participants as "plurilingual" or "multilingual," this could mean different things: it could refer to the societies in which the research took place, the number of languages spoken by the person, or a specific combination of languages in the person's repertoire.

Table 3. Counts of different conceptualization of multilingual participant (Source: Own elaboration)

Conceptualizations of multilingual participants	Count
Context based	**15**
Bilinguals	1
FL-learners	8
L2-Language learners	1
L3-Language learners	1
Multilinguals	1
Plurilinguals	1
Undetermined	2
Language based: Number of known languages	**10**
FL-learners	1
Multilinguals	7
Plurilinguals	1
Trilinguals	1
Language based: Specific L2*	**6**
FL-learners	2
L2-Language learners	3
SL-learners	1
Language based: Specific L2, Specific L3	**8**
Bilinguals	1
FL-learners	1
L3-Language learners	4
Plurilinguals	1
Trilinguals	1
Language based: Specific L3	**6**
L3-Language learners	5
L3+-Language learners*	1
Other	**7**
Language majors	2
LOTE learners	1
Multilinguals	3
Plurilinguals	1
Grand Total	**52**

A significant portion of the studies (n = 15) related the multilingual character of the participants to their learning context: multilingual societies, schools, or under a broad understanding of foreign language learners (i.e., people who are learning a language that is not spoken in the country where learning takes place). This implies that multilingualism is seen as a social construct influenced by external factors and is thus contextual rather than purely based on linguistic abilities. For example, Ruiz De Zarobe and Zenotz (2015, 2017) perform their reading in CLIL (Content and Language Integrated Learning) research in the Trilingual Education Framework of the Basque Country, which is based on instruction given in Spanish, Basque, and English. In this case, trilingualism is ensured in the educational framework where the participants are inscribed.

Other studies linked participants' multilingualism to the number of languages they knew (n = 11). In these cases, the specific order, number, or context of language learning was considered less important than the sheer fact of knowing multiple languages. In this same group, the conceptualization of "trilinguals" is an exception since, in this case, the number of languages had to be precisely three. In any case, this approach simplifies the definition of multilingual to anyone who can use three or more languages (Aksak & Cubukcu, 2022; Calafato & Simmonds, 2023; Hanžić Deda, 2021; Redmer, 2022; Sommer-Farias, 2020; Wagemaker, 2022; Wen, 2022).

Three groups of language-based criteria were established with specific references to L2, L3, or a specific combination of languages. In these cases, the multilingual experience was connected to language status or chronological order in which learning occurred. Under the scope of this paper, the groups on L3+ and L2/L3 combinations are particularly noteworthy, as their conceptualizations of multilingualism follow clear patterns, with 'L3-language learners' being the most frequently used term to emphasize the status of a language beyond the second one (Özkan Gürses, 2021; Öztekin & Erçetin, 2022; Razkane & Diouny, 2022; Wach, 2016) It is also logical that the 'Specific L2/Specific L3' group includes bilinguals, as is the case with Maghsoudi et al. (2022), since this concept can encompass individuals who have mastered one language and are in the process of acquiring a new one. In their case, they were dealing with a sample that was partly monolingual and partly bilingual learning L3-English.

A more problematic group is the "Specific L2" group, for their conceptualization does not include subsequent languages beyond the third one, even though multilinguals are at least part of their samples. In these cases, the category of "L2-learners" shows a complete amalgamation of L3 data to SLA for any language after the first one is considered an L2(Csizér & Tankó, 2017; Prilutskaya et al., 2020; Wen & Piao, 2020). Moreover, the concept of "FL-learner," which could also be considered context-based, is still used almost interchangeably in the two occurrences within this group with the term "L2-English" (Piechurska-Kuciel, 2016; Wei et al., 2023). A particular case is Abbott and Lee (2023), who studied ESL (English as Second Language), pointing to English as an L2 in an English-speaking environment. However, it is mentioned that 51% of the participants were also fluent multilingual speakers of other languages.

The final category, "Others", groups conceptualizations with set definitions of multilinguals that do not comply with the same criteria as stated above. The conceptualization of "LOTE" (Languages Other Than English; Li et al., 2023), for example, makes a distinction based on the mainstream character of languages, and focuses of Portuguese in particular. Other deal with higher education students that are majoring in a specific combination of languages (Przybył, 2023; Xu & Wang, 2024), which I decided to group as others for they did not necessarily limit their participants on the bases of a combination of languages, but only by belonging to a specific group (in many cases, the participants had broader language repertoires). Finally, three cases within this

group used overarching definitions of plurilingualism and multilingualism: Festman and Schwieter (2019) and Filippi et al. (2020) who considered bilinguals and multilinguals as instances where two or more languages were used indistinctively, and Le Pichon et al. (2013) who go even further to consider plurilingualism as instances of monolinguals and bilinguals learning subsequent languages.

These varying conceptualizations reflect the diversity of multilingual experience and expose gaps in how multilingualism is theoretically framed and operationalized in research.

Discussion

This scoping review explored how existing research on MC and SR in language learning addresses the distinct characteristics of multilingual populations. For this purpose, the study delved into three central dimensions where multilingualism intersects with MC/SR research. It explored the role of participants' multilingualism in the study designs, specifically assessing whether multilingual traits are incorporated. Additionally, it evaluated the interaction between cited works in the reviewed papers, highlighting the resulting networks. Lastly, it addresses how multilingual populations are conceptualized, examining how participants are described and the theoretical or practical bases for these conceptualizations.

The first two dimensions of this study are deeply intertwined from an ontological and epistemological point of view, as they guide how authors frame their research questions and define the boundaries of their inquiries. Ontologically, the fundamental question is what phenomena are they *truly* studying, particularly concerning multilingualism and its distinctive characteristics. This includes deciding whether multilingualism is treated as a unique cognitive phenomenon distinct from SLA or simply as an extension of bilingualism. Epistemologically, the concern is how we come to know and establish knowledge about these phenomena, focusing on the scientific bases, methodologies, and theoretical principles researchers employ.

The theoretical foundations supporting multilingualism in the reviewed studies varied widely, with many relying on SLA theories that often failed to account for the specific complexities of multilingual populations. This was a central issue addressed in the study, which sought to assess the extent to which multilingualism is integrated into research on MC and SR.

The analysis of the designs of the reviewed literature revealed that most studies did not distinguish between bilinguals and multilinguals, underscoring the need for more rigorous participant selection and consideration of confounding variables related to levels of multilingualism. This distinction is essential for obtaining accurate insights into the effects of language experience on the studied phenomena. De Angelis (2007) already noted the overgeneralization of L3/Ln phenomena to SLA, stating that "second" language often refers to any non-native language being acquired (De Angelis, 2007, p. 5). The author argues this reflects the view of multilinguals “as bilinguals with additional languages rather than speakers of several languages from the start” (De Angelis, 2007, p. 24), potentially obscuring differences in the acquisition processes of a first additional language versus subsequent ones (Bardel & Falk, 2007; Cenoz, 2003; Herdina & Jessner, 2002; Mulík, 2018). Naturally, the scope and context of each research article might determine how (and if) they address the multilingual status of participants; this is central to the argument being made here: complex linguistic repertoires can significantly impact results if not accounted for as potential confounding variables, underscoring the need for clarity and explicitness in their consideration.

These results show that this differentiation has not entirely penetrated the theoretical positions of MC and SR research. This can be problematic for several reasons. First, ignoring this distinction might lead to overgeneralization of findings from SLA to subsequent language learning. As Herdina and Jessner (2002) have noted, bilingualism could be considered a variant of multilingualism, but not all the conclusions drawn from bilingual research can be expanded to encompass L3/Ln acquisition. Cenoz (2003) agrees that second and subsequent language acquisition share many characteristics, but emphasizes the effects of prior language experience and access to wider linguistic repertoires, making L3/Ln a distinct phenomenon. Hence, it could be argued that although multilingual research could be extended in some cases to SLA phenomena, the opposite would be controversial to sustain. These differences have been examined by looking at cross-linguistic influence and language transfer (e.g., Falk & Bardel, 2011; Onishi, 2016), and less commonly regarding strategic action (Wach, 2016). In this last regard, Jessner (2018) advocates for the need for the distinction and further research, for "SLA does not offer an accurate framework for these kinds of studies and therefore cannot be applied to highly complex and dynamic systems as those represented by multilinguals" (p. 43).

Moreover, treating L2 and L3/Ln as equivalent phenomena might disregard the linguistic, cognitive, and social dynamics of multilingualism. In this sense, Ortega Duran (2017) affirms that the number of languages or the multilingual adds to the complexity of language learning and acquisition, and that it is fundamental to look at individual differences as affecting this increased complexity of multilingual systems. In similar terms, Jessner (2018) has argued for the need to avoid simplistic explanations of language learning phenomena and to consider the "hypercomplexity of the multilingual mind" (p. 43) highlighting the intricate nature of multilingual cognition, a unique and distinct dimension that requires specialized attention.

In terms of the second aspect of this research, examining the intellectual structures underlying this field of research, it is crucial to consider who is cited and the intellectual networks to which they belong. From the analysis of this intellectual structure, where certain texts of similar frameworks co-occur, it becomes evident that they share common approaches to addressing their target phenomena. This co-occurrence suggests that they form paradigms in the sense that Kuhn (1996) describes scientific theories—representing not only dominant models of inquiry but also sets of shared assumptions, methods, and standards that guide how researchers define problems and interpret findings. In Kuhn's view, paradigms shape the boundaries of normal science by determining what is studied, how research is conducted, and how results are understood within a given field. Similarly, the frameworks of L3/Ln acquisition, multilingualism, bilingualism, and SLA establish structured approaches to studying language learning, creating a consensus around certain methods and theoretical perspectives, while also directing future research within these paradigmatic boundaries.

The findings reveal a substantial gap, with numerous studies overlooking the distinct cognitive and linguistic processes involved in managing multiple languages. The repeated citation of specific authors suggests that scholars are engaging within intellectual networks that support various theoretical approaches, yet these approaches may inadequately address the realities of multilingualism. This gap underscores the need for theoretical development, particularly through frameworks such as Complex Dynamic Systems Theory (CDST), which provides a nuanced understanding of how cognitive, social, and linguistic factors interact in multilingualism, leading to emergent properties (Griffiths & Soruç, 2020; Larsen-Freeman, 2011). By incorporating such frameworks, future research can better capture the intricate ways in which multilingualism

influences MC and SR, contributing to a more comprehensive understanding of language learning in multilingual contexts.

Building on this gap, it is crucial to explore how MC and SR, or the broader construct of "self-regulatory action," (Kaplan, 2008) play pivotal roles in multilingual learning. Multilingual individuals, due to their increased language experience, may exhibit distinct features in how they manage themselves and the language-learning task (Greve et al., 2024, p. 822). These learners often must navigate multiple linguistic systems simultaneously, requiring enhanced cognitive monitoring and adaptive strategies to manage the complexities of language use, transfer, and development across languages. In this context, the ability to plan, monitor, and evaluate one's learning processes (key components of metacognition and self-regulation) may be particularly pronounced in multilingual learners (Jessner, 2018).

In conclusion, the intersection of MC, SR, and multilingualism presents a promising area of inquiry where these strands of research could reinforce each other. By focusing on how bi- and multilingual individuals use MC and SR in language learning, future studies could offer deeper insights into the cognitive advantages conferred by multilingualism. Such research could highlight the strategic, self-regulatory strengths that multilinguals possess, providing evidence for the argument that multilingualism enhances subsequent language learning and suggesting ways to leverage these strengths in educational and applied settings.

Finally, the conceptualization of multilingualism in the reviewed studies was highly inconsistent, ranging from context-based definitions (e.g., multilingual societies) to language-based criteria, such as the number of languages spoken. This lack of consistency raises critical theoretical issues, as there was no unified approach to defining multilingualism across the studies. This variability was anticipated, given the complex theoretical landscape and the absence of standardized frameworks for describing multilingual repertoires. Although some areas have agreed definitions, these were not consistently reflected in the reviewed literature. This inconsistency may stem from the broader underdevelopment of multilingualism and L3 acquisition theories concerning MC and SR research. The failure to provide detailed descriptions of multilingual repertoires is problematic because it risks overlooking multilingualism as a potential confounding variable in interpreting results. Therefore, it is recommended that future studies offer more comprehensive descriptions of participants' multilingual repertoires and use standardized tools to reconstruct language learning histories, ensuring that multilingualism is appropriately considered when interpreting research findings.

Keeping all of this into consideration, at a minimum, studies should establish a clear distinction between individuals who have learned or acquired only one additional language and those with a more varied repertoire. Of course, this predicament opens several challenges, such as establishing and measuring participants' proficiency levels while considering the multiple ways in which proficiency can be measured. In addition, prior language and learning experience of control groups should be carefully described. In any case, future research could employ clearer conceptualizations of "multilinguals," especially in studies on self-regulated action.

Conclusion

This scoping review identified significant gaps in how research on MC and SR addresses multilingualism in language learning. Many studies failed to distinguish between bilinguals and multilinguals, often overgeneralizing findings from SLA. This lack of differentiation limits the

understanding of the distinct cognitive and linguistic processes involved in managing multiple languages. Furthermore, the reviewed studies lacked consistent definitions of multilingualism, highlighting the need for more precise participant selection and standardized tools to capture multilingual repertoires and language learning histories.

The review also examined the intellectual structures underlying the field, finding that many researchers operate within established SLA paradigms, which do not fully account for the complexities of multilingualism. This reliance on traditional frameworks may obscure the unique features of multilingual cognition. Adopting more dynamic theoretical frameworks, such as Complex Dynamic Systems Theory (CDST), is recommended to address these limitations. This meta-theory offers a more nuanced understanding of how cognitive, social, and linguistic factors interact in multilingualism, providing a stronger foundation for future research.

Moving forward, studies should clearly differentiate between bilingual and multilingual participants, adopt more flexible theoretical frameworks, and further explore the role of MC and SR in multilingual learning. By standardizing definitions and tools for assessing multilingualism and focusing on how self-regulatory action benefits multilingual learners, future research can better capture the intricate ways in which multilingualism influences language learning, ultimately advancing both theory and practice in the field.

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